

# O-band 56GBaud InP Mach-Zehnder-Modulator

## General Description

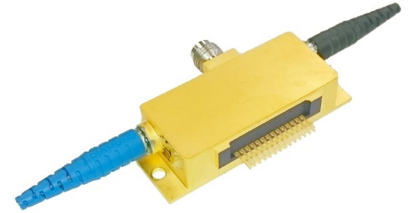
The Indium-Phosphide Mach-Zehnder-Modulator is ideally suited for optical transport applications within the O-band. It features a unique traveling-wave-electrode design, resulting in high bandwidth and zero chirp.

## Applications

56GBaud, 4PAM, 2PSK

## Features

- O-band operations (1280-1340nm)
- High bandwidth
- Traveling-wave-electrode design with zero chirp
- Evaluation-board with integrated TEC-control included
- Adjustable  $V\pi$

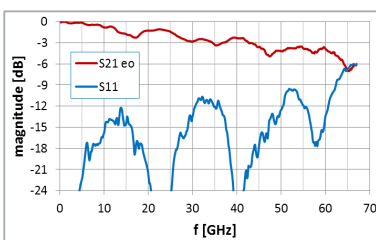


## Operating Conditions / Absolute Maximum Ratings

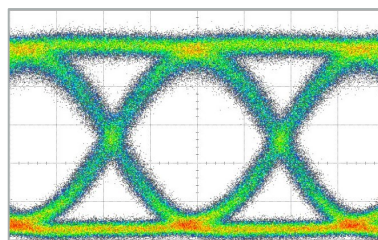
Parameter	Unit	Min	Typ	Max
Optical wavelength	nm	1280	1310	1340
Optical input power	dBm		10	16
Temperature	°C		25	50
Bias voltage $V_{\text{bias}}$	V	3		10
Phase-voltage	V	-10		0
TEC-control supply voltage	V		5	
TEC-control driving current	A		0.3	1

## Performance

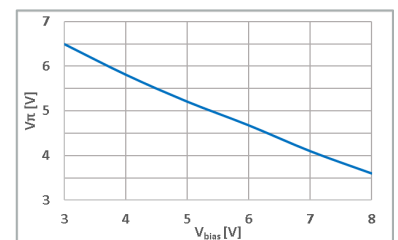
Parameter	Symbol	Unit	Typ	Comments
Insertion loss	IL	dB	8.5	@ max. transmission
Extinction ratio (dynamic)	ER	dB	>10	@ 56GBaud
Extinction ratio (DC)	ER	dB	>20	
3dB EO cut-off frequency	$f_{3\text{dB}}$	GHz	35	
Bias voltage	$V_{\text{bias}}$	V	8	
Phase voltage	P1   P2	V	-3	quadrature point
$V\pi$		V	3.5	@ $V_{\text{bias}} = +8\text{V}$



Small signal response



Eye diagram @ 56GBaud (RF- $V_{\text{pp}}$ : 3.5V)



$V\pi = f(V_{\text{bias}})$  @ 1310 nm

HHI reserves the right to change specifications without any prior notice at any time

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# O-band 56GBaud InP Mach-Zehnder-Modulator

## General Instructions / Precautions

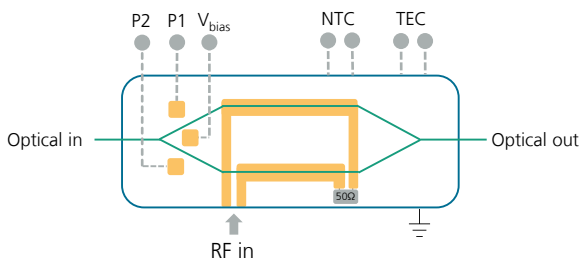
An InP-Mach-Zehnder-Modulator contains several semiconductor-p-i-n junctions, a faulty DC-operation will result in an irreversible damage of the device. Please use the electric circuit diagram for correct DC-wiring. Don't exceed maximum values for Phase- and Bias-voltages.  $V_{bias}$  has to be always positive, referenced against GND. Phase voltages has to be always negative, referenced against  $V_{bias}$ . Use voltage sources with integrated current limiter.

Limits:  $V_{bias}$  : 3 mA, Phase: 1 mA.

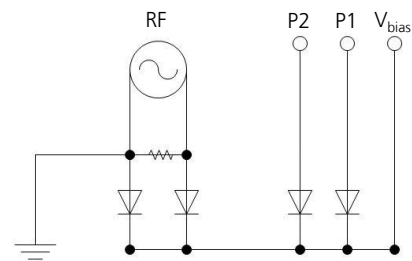
## Connections / Specifications

- Optical connections: SSMF with FC/APC connectors
- RF: single ended, 1.85mm female
- DC: Evaluation board with integrated TEC-control and preconfigured cable assembly (4mm banana jacks)

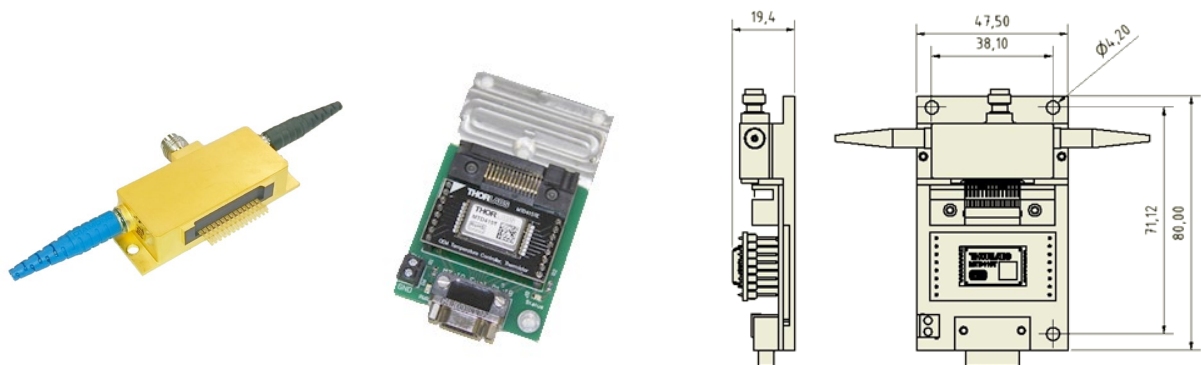
## Device diagram



## Electric circuit diagram



## Drawings / pictures evaluation board and module



## Part Numbers

- Module: MZM\_M\_O\_35\_22
- Evaluation board: EVAL\_M\_22

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